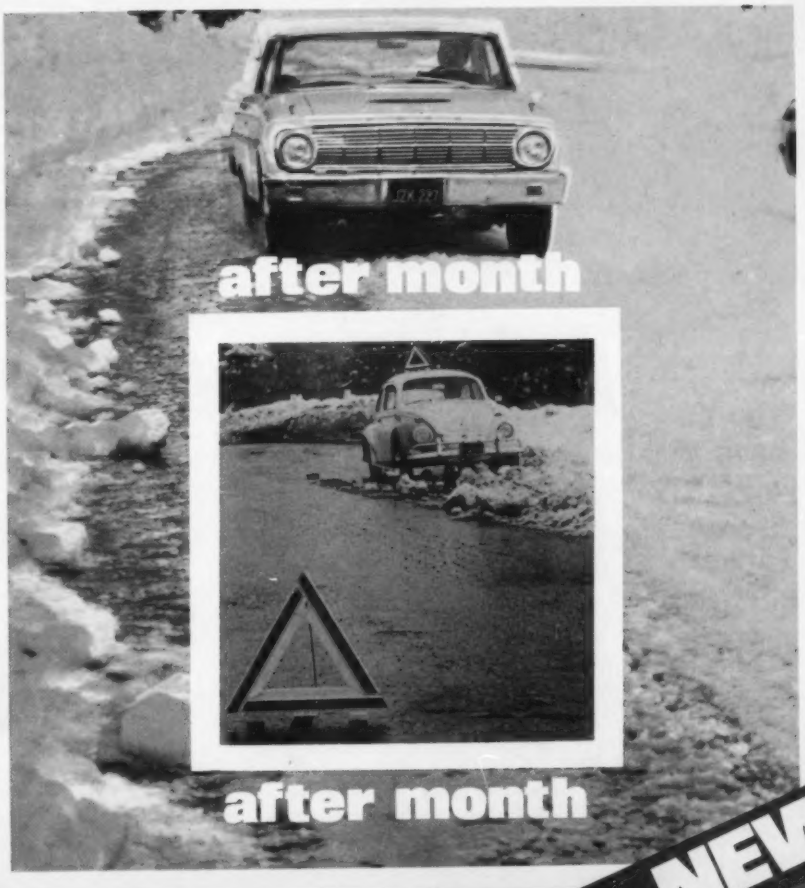
DRiVER

OCTOBER 1978

winter driving month



after month

after month

The NEW CARS

DRiVER

You may have to be a winter sports freak to look forward to snowy weather, but it needn't scare you if you're prepared for it

Sometimes you have no option but to dig yourself out.

anti-freeze

or . . . preparing your car—and yourself —for winter

"Catcher's mitt . . . overdue library books . . . suntan oil . . . hey, here's my green socks! But where the #$%& are those tire chains?"

What's your reaction when you see the first big snow of the season? The morning sky is dark and the white stuff is still dropping. You can't make out where the street ends and the sidewalk begins. You can feel the cold through the window, even inside a heated building. So what's the first thing you do?

Do you growl, kick the dog and slaughter your morning omelette? Or do you run madly for the closet and dig into the back for your skis, ice skates and toboggan?

And what do you first think of when your car comes to mind? "Why the heck didn't I put those snow tires on last week?" Or maybe, "I guess I've got everything in the trunk. I'll just get my galoshes and dig the car out."

Well, we hope it's the latter. If you live in the areas where October brings snow and ice, you should be expecting it. Precautions will eliminate any last-minute work, like trying to change to snow tires in 30-degree weather.

We'll give you a few hints on preparing for winter, and also some tips on driving through the frozen months.

First the preparations.

Open up and say ah: Let's take a look under the hood of the auto. Do this while the weather's still warm; you may not want to after the freeze comes. (Just kiddin', folks. If you let your car go all winter without servicing it, we'll string you up by your toes.) Under the hood you'll find an engine and a lot of related stuff that makes the car go.

Like spark plugs, for instance. When was the last time you tuned up the engine? Just before winter is an excellent time to get this accomplished, unless someone decides to pour a basket of leaves on you and the engine.

And then with a nice smooth-running engine, you can think about a nice, smooth-running, *clean* engine. What we mean is changing the oil. Regular readers know we are really adamant on this point. If you want the thing to run well, and if you want the engine to last longer, change the oil regularly. And if you do it now, you won't have to worry about it if the weather won't permit another change for two or three months. Change the oil filter and the air filter at the same time.

For smooth operation and easier starts on extremely cold mornings, use a light-weight oil, or a multi-viscosity oil. (See the neat little chart we've included. If you're interested in more on oil, check your dusty bookshelf for the March and April '78 issues of DRIVER.)

Here's another hint for easier starts on cold mornings: Make sure there's a small black (or other-colored) box

continued

DRIVER

THE
TRAFFIC SAFETY MAGAZINE
FOR THE MILITARY DRIVER

DEPARTMENT OF THE AIR FORCE
HQ AIR FORCE INSPECTION AND SAFETY CENTER
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OCT

VOLUME 12 NUMBER 5

CONTENTS

Features	Page
Anti-Freeze	1
It's Gonna Be Fine In '79	10
Restraining Your Child	16
Recall Campaigns	20
A Quickie Reflex Test	Back Cover

Departments	
Double Clutch	2
How It Happens	9
Timely Topics	19
The Backyard Mechanic	22
Backfire	28

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THE EDITOR SPEAKS

DOUBLE CLUTCH

BUYING A "NON-COMPLYING" CAR

As our country's safety and anti-pollution standards get tougher with each passing year, it's also getting tougher for an individual to import a car that wasn't built for the American market. Before you buy a 1968 or later model car overseas which was not manufactured for sale in the U.S., think about the hurdles you face. They're really tough and can be brutally expensive.

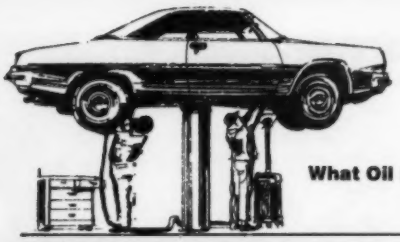
First, you have to pay for shipping the car to an American port plus the duty. You figured on that, of course. But the rest of this may come as a surprise.

When the car arrives, U.S. Customs officials will impound it because it does not meet American standards. Customs will release the car to you so that you can have the necessary modifications accomplished **after you post a cash bond equal to the value of the automobile.** You'll have trouble finding a company to write a bond for you, so plan to have the cash.

It is illegal for the car to be driven while the work is being done. You have 90 days to get the car up to standard, but you can apply for an extension. Otherwise you will be fined.

The newer your car, the more extensive the work will be. A 1978 Mercedes that was not built for the U.S. market, for example, cannot meet American safety standards in 14 ways, including seat belt warning devices, side-door beams, bumpers, headlights, door locks, and windshield installation. Some of these jobs get very expensive. It costs General Motors $5 to install a door beam on the assembly line; installing the

continued on page 19



What Oil Should You Use?

A custom-made car cover like this will make it easier to clear off the car in the morning, or you could use a tarp to cover the windshield.

In winter, there are certain mountain areas you won't be allowed into without the proper tires, or chains.

attached to the engine with wires. This thing, called a battery, will work a lot better if it's fully charged. Then you won't hear that funny noise like you turned off the stereo without removing the needle from the record. Seriously, cold weather can seriously affect a marginal battery, and if it won't start the engine you could get stuck somewhere.

Another thing that could mess up the works is lack of coolant in the radiator. In the summer it prevents boilovers, and in the winter it prevents freeze-ups (therefore the other name for this marvelous liquid, anti-freeze). Follow the instructions on the container for the proper mixture of water and coolant. The coolant also helps prevent your radiator from rusting inside – great stuff, ain't it?

Before you close the hood, look in that little plastic reservoir (or rubber bag) to make sure there's plenty of windshield washer solution. Despite all the clean rain and snow, winter is a notoriously dirty time of year, so you'll need it.

Then go ahead and close the hood and make sure there's something to wipe that solution off after you've sprayed it all over your windshield. Broken, cracked wipers will cause you nothing but headaches as you try to see through the film they've left on the window. Think of the cost of wipers as an investment in your eyesight, if nothing else.

Now if you haven't looked for a while, check out your lights – all of them, head and tail. And run the heater and defroster to make sure they're okay.

Okay, enough sitting around; back outside.

Get under the car. Jack it up and put it on safety stands, or get it on a hoist or something. And then look for any leaks in the exhaust system. Things like rusty spots on some of the pipes or the muffler. If there are any, they could get much, much worse once the water, snow, slush and ice go to work on them. Exhaust leaks are bad for the car, and they're bad for your health, too.

And now for something that's of A-number-one-prime importance – brakes. Take all the wheels off (it's easier to do this if you raise the car up first) and examine the linings/pads. Replace them if that's indicated, and adjust them so they stop evenly on both sides.

You've gone to all the trouble to make sure the thing'll start and run, it's nice to think it'll also stop when you'd like it to. Otherwise, you're driving a 3000-pound battering ram.

Stick-to-it-iveness: Your most important worry on uncertain surfaces is traction. Our handy office dictionary defines traction (for our purpose) as "the adhesive friction of a body on a surface on which it moves." Good word, "adhesive." It suggests stickiness, and you certainly want to stick to the road.

So for traction, and sticking to the road, you need a special surface that will allow you to move with ease. Of course, winter messes up the *road* surface, so you can partially make up for it with the *tire* surface you choose.

The most common types of tires are the bias-ply variety and the steel-belted radials. Both can be obtained in a snow tire version with thicker, heavier treads and deeper grooves for better traction. Because of these treads, we recommend the use of snow tires for anyone who'll be traveling in areas where snow and icy highway conditions can occur.

You may have your own reasons for liking bias-plies or radials, so we won't push one or the other. But we will give one pointer. Don't put a mix of regular and radial tires on one car.

continued

anti-freeze

continued

The handling characteristics of radials are different from bias-ply tires. Radials are constructed so that more tread is in contact with the road at one time (that squashy appearance that makes them look a little flat). And when you turn, the radials assume the new direction of the car immediately. With regular tires on the rear, you could go into a skid, especially on ice. So put only one kind of tire on your car.

There are also snow tires with studs imbedded in the tread, either metal or the so-called "soft studs." These are generally held to be more effective than regular snow tires, although some will dispute this fact, as we discovered after our last winter driving feature. In any case, if you opt for studs, be sure your state will allow them, and at what times during the year. To help there, we've printed a listing (see page 6) of the regulations concerning studs. Check with your state's highway patrol to be certain.

Your best bet, in the really lousy conditions, is the good ol' tire chain.

You can get regular chains, or you can purchase the kind with cleats, for more digging power. Of course, whatever kind you use, chains have to be taken off when the conditions no longer warrant their use. Any sort of metal on your tires, studs or chains, will tear up the road, and state governments are understandably reluctant to resurface their highways every year.

Chains are not the hassle their reputation would have you believe. Just follow the instructions provided with the chains for applying them to your wheels, and you're ready to go.

There are those do-it-yourselfers who think they can get more traction by letting a little air out of their tires. To them we say, "Forget it." Not only will this method make handling the car more difficult, it'll also make your tires wear out faster. It will *not* give you any more traction. Break down and take your money to the tire place for some new snow tires.

Tools and parts and . . . So now your car is ready. Make sure you're prepared for any emergencies by keeping the proper tools and equipment with you.

At one end of your car is a compartment in which you can stow all manner of items. The trunk is used for storing tools, newspapers, blankets, broken pieces off the car like the aerial, and even the jack and spare tire. In winter the trunk can contain your survival kit.

First, if you need to, clean the trunk out. That'll give you room for all the stuff you'll need. We hope you keep the things in this first list in there at all times; they're useful all year. But if you don't now is a good time to start getting good habits.

Tools: Get a few assorted screwdrivers, an adjustable wrench and a pair of pliers. A roll of electrical tape and a spool of medium-gauge wire also go in here.

For emergency situations, you should also have spare bulbs and fuses, a couple of cans of oil, some brake fluid, and a container of coolant. If your car uses power steering fluid or automatic transmission fluid, have some of those as well. A first aid kit is a wise precaution. And for warning other motorists when your car breaks

continued

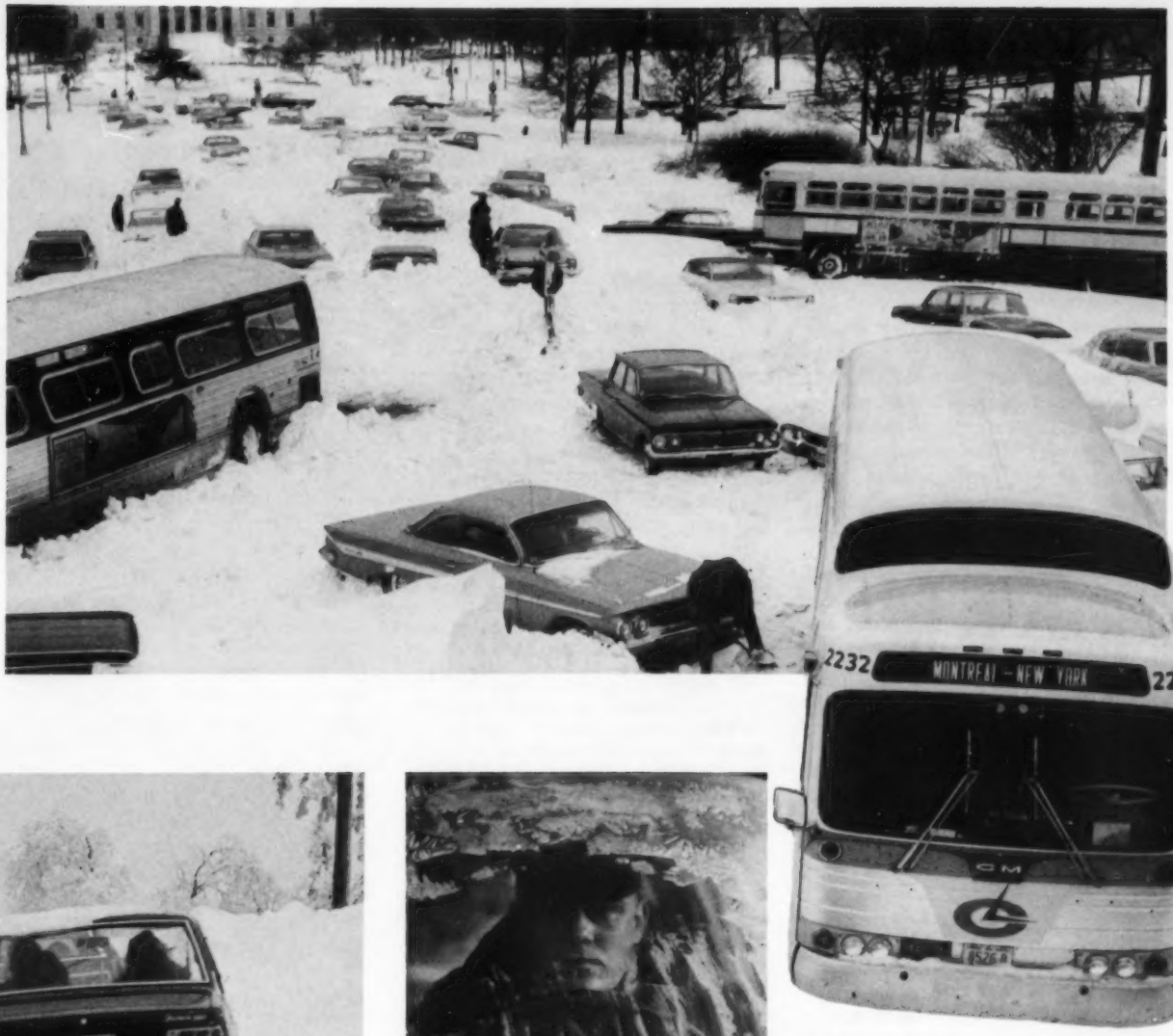
When you see a sign like this, the area probably has a justly-deserved reputation for slickness.

Never follow too closely on slick roads. You need maximum distance in which to stop safely in an emergency.

RUST PROOFING

In most places your friendly city government and the highway department will do their part to give you some traction. They might use the big earth-moving vehicles to clear the snow off. Or they might bring a touch of the Sahara to your winter Siberia by applying sand to the roads. Some places use salt, and some use a combination of salt and sand.

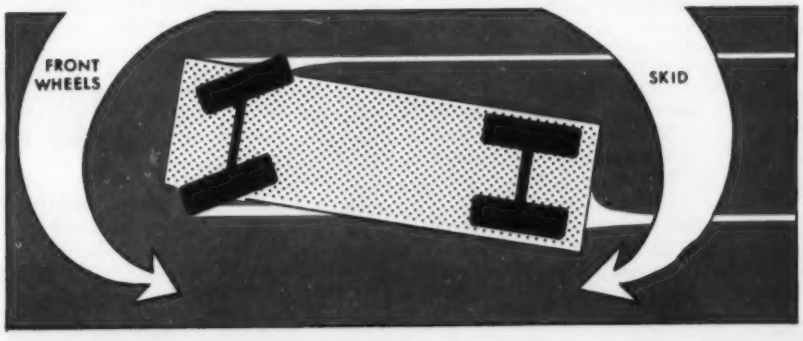
Whatever the method, it'll do its job and then it'll leave your car in a mess. Passing cars will grind the sand into dust, and that'll mix with the slush to pelt your car with slop. And there'll be that salt, which is an old enemy of auto paint. By spring, there could be more rust than good metal in the car.



Blizzard conditions can bring a city to a standstill, as the past couple of winters have shown. Be patient; don't be in a hurry to reach your destination.

Maybe he didn't want to ruin the neat patterns of ice on the windshield. But later he may wish he could see out.

(below)
Skidding is easy to control if you pump your brakes and turn your front wheels *into* the skid. If the rear of the car skids to the right, steer right. If it goes left, steer left.



That may be an exaggeration, but it's a good idea to wash the car as often as you can in winter. We know some part of Murphy's Law states that just after you wash the car, it'll rain (or snow). But by the same rule, if you don't wash the car it won't snow for six weeks, and the salt will eat through to bare metal. Take your pick.

This is a list, by state and province, of the restrictions on the use of studded tires in the United States and Canada. The dates refer to the time periods during which studs may be used. Check with the highway patrol to be certain.

This guy has the number one tool against winter—the ice scraper. Another good kind has a brush at the other end.

Alabama—No restrictions
Alaska—September 15-May 1
Arizona—October 1-May 1
Arkansas—November 1-April 30
California—October 1-May 1
Colorado—No restrictions
Connecticut—October 15-April 30
Delaware—October 15-April 15
District of Columbia—October 15-April 15
Florida—Metal-studded tires are prohibited; rubber-studs are permitted.
Georgia—No restrictions
Hawaii—Prohibited
Idaho—October 1-April 15
Illinois—Completely banned
Indiana—October 1-April 30
Iowa—November 1-April 1
Kansas—November 1-April 15
Kentucky—No restrictions
Louisiana—Completely banned
Maine—October 2-April 30
Maryland—October 15-April 15
Massachusetts—November 2-April 30
Michigan—State-approved "soft studs" permitted November 15-April 1; northern regions permitted October 1-May 1.
Minnesota—Prohibited, except out-of-state vehicles may use studded tires for 30 days.
Mississippi—Completely banned
Missouri—November 1-April 1
Montana—October 1-May 31
Nebraska—October 1-April 15
Nevada—September 1-April 30
New Hampshire—No restrictions
New Jersey—November 15-April 1
New Mexico—Permitted only when required for safety and stopping purposes.
New York—October 6-April 30
North Carolina—No restrictions
North Dakota—October 15-April 15
Ohio—November 1-April 15
Oklahoma—November 1-April 1
Oregon—November 1-April 30
Pennsylvania—November 1-April 30
Rhode Island—October 31-April 1
South Carolina—No restrictions
South Dakota—No restrictions
Tennessee—No restrictions
Texas—Metal-studded tires are prohibited; rubber-studs are permitted.
Utah—Only tungsten carbide soft studs permitted October 15-March 31.
Vermont—No restrictions
Virginia—October 15-April 15
Washington—November 1-April 1
West Virginia—November 1-April 1
Wisconsin—Completely banned
Wyoming—No restrictions

CANADIAN PROVINCES

Alberta—No restrictions
British Columbia—October 1-April 30
Manitoba—October 1-April 30
New Brunswick—October 15-April 15
Newfoundland—November 1-April 30
Northwest Territories—No restirctions
Nova Scotia—October 15-April 15
Ontario—Completely banned
Prince Edward Island—October 1-May 31
Quebec—October 15-May 1
Saskatchewan—No restrictions
Yukon Territory—No restrictions

Data courtesy American Automobile Association

down, get some road flares, or reflectors.

Then remember to have spare wiper blades and windshield washer solution – this system has some hard work to do in the winter. An extra fanbelt (or whatever-belt) can't hurt either.

Finally, some roadmaps, a flashlight with extra batteries and a set of jumper cables.

Okay, that's for all-year use. Now for the cold weather supplies. First, an ice scraper with a brush on the other end of the handle. (You'll need that more than anything else, in normal situations.) A small shovel could help dig you out of that snowbank you so wrecklessly got stuck in. And a small quantity of sand or salt could help give you traction when you need it. Note we said *small*. If you load down the trunk with a 50-pound bag of sand, you're just making it easier to skid the car around, and suspension won't dig it too much either. Add to this list a tow rope or chain, and some gas line antifreeze.

After you've done all you can to prepare the car, sit back and wait for the snow.

De-icing: What could be more fun than coming out to your car in the morning and finding it covered with a two-inch layer of ice? The stuff you need a pick-axe to remove. Or dynamite.

There are several ways to eliminate this problem, or at least decrease the hassle. The first, and best, is a garage. That'll keep the car a little warmer, and also keep it out of the snow. It'll start more easily and won't require fifteen minutes of brushing and scraping. A carport will keep only falling snow off, not blowing snow, but it's still better than open air.

What if you're not one of the lucky ones who is blessed with his own garage or carport? Try covering the car with a tarpaulin, or get one of those custom-made car covers. Lacking something that large, try covering the windows, or at least the windshield and back window. Anything you can do to decrease the strain on the battery will be a good thing, and the defrosters put a drain on it. The less time they're running the better.

But if you don't have anything that will serve to cover the windows, or if an unexpected snowstorm surprises you, you'll just have to contend with the ice.

Dig out the plastic ice scraper/brush. Get the car started and run the defroster. Then brush off the snow and attack the ice with the scraper.

It's best to brush it all off – hood, fenders and trunk. Then after you start it won't be blowing around and getting on the windows. And scrape off all the windows *completely*. Remember how they taught you in driver's training that you have a blind spot when you're driving that the mirrors don't cover? Leaving ice on any of the windows will create blind spots that even turning your head won't eliminate. And with the number of nuts on the road when it's icy, you'll want to have the widest possible field of view.

Good and bad moves: Would you believe we're ready to go? Well, we are. Pay close attention to this stuff about driving on slick surfaces. Some of you are from parts of the country where snow is unknown, and driving on it is trickier than you think. A lot trickier. Some others of you are well acquainted with snow, but you drive like you've never seen it before. Trying for jack-rabbit starts, not allowing enough room for a stop, stuff like that.

We've said this before, but it bears repeating – be more cautious than you usually would on snowy or icy roads. Allow more time for *everything*, turns, stops, starts.

We'll start with starts.

Here's a scene we have seen more than once. The city streets. Snow and ice everywhere. An intersection with dozens of cars at the stoplight. The light changes and those first in line gun their engines to start moving. Their wheels spin and throw snow and slush on those behind. Some of them get their cars moving this way, but more of them don't. Now, are these people just dumb, or are they angry or what? Seems someone would have told them that's not the proper way to move on snow. Or maybe they weren't listening.

You're listening aren't you? Good; here's the right way: Apply about the lightest pressure on the gas pedal that you can to get the car rolling. Pretend you're racing a snail and you want to lose. We're not kidding – you have to give your rear wheels (or front wheels, if such is the case) a chance to grip on something. You have an easier time walking on ice if you walk slowly, and it's not any different in a car.

You can always tell from the feel and sound if you're giving the accelerator too much pressure. If nothing else, the fact you're not moving and the speedometer reads 10 mph could give you a clue.

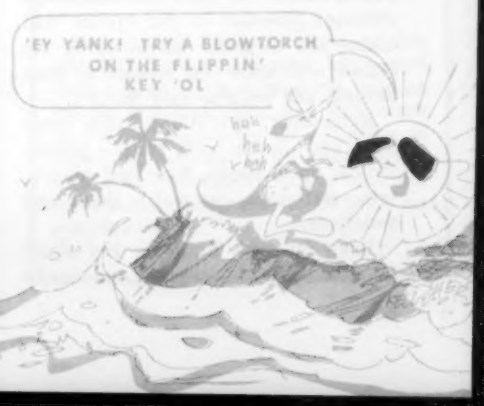
Once you're actually moving you can speed up. But only *gradually*. You can spin the wheels just as easily after you start, just by applying too much foot on the gas. So keep your speed down. We mean below the posted limit – the limits on the signs are for dry roads, not for the wet surfaces.

So now you're moving. Your troubles aren't over. Sooner or later you'll need to make a turn or the road will curve; you can't go straight forever. Turns are not too bad if you remember

continued

Did you ever come outside to your car after a bad snowstorm and find you couldn't even get the doors open? Frozen doorlocks will occasionally happen. They're usually not too serious a problem, however. Just heat up your key a little and insert it in the lock. Usually just the warmth of your hand will heat the key enough to thaw the stubborn lock. Or the flame from a match or a lighter may do the trick—but be careful not to set fire to your gloves. Try this a few times until the lock turns.

One of our staff discovered frozen doorlocks one morning on his little subcompact. When heating the key had no effect, he finally gained entry by means of the rear hatch and forced the doors open from the inside. Shows there are different ways to attack problems.



the speed rule: The less speed, the better.

Anticipate your moves. If you're going to turn at the next corner, slow down before you get there. Taking your foot off the gas is the first step, and then pumping the brakes will slow you to the proper speed for the turn.

"Why pump the brakes?" you ask. Simple. Locking the wheels will cause you to slide. On slick surfaces, even constant pressure to the brakes will cause you to slide. So pumping the brakes will allow the wheels to keep turning, and yet also slow the car.

Remember, everything takes more time and distance on snow – getting the car up to speed, turns and maneuvers, and stops. So watch ahead and anticipate.

Keep far back from the guy ahead of you – you know, the one who rocketed away from the light (or tried to) and covered your windshield with slush. If he rear-ends someone, it'd be nice if you had the space to stop and avoid hitting *him*. Allow more space than you would on a dry road.

Stops require just what we've already mentioned – the long space ahead of you, and the gradual slowing of the car, pumping the brakes if necessary.

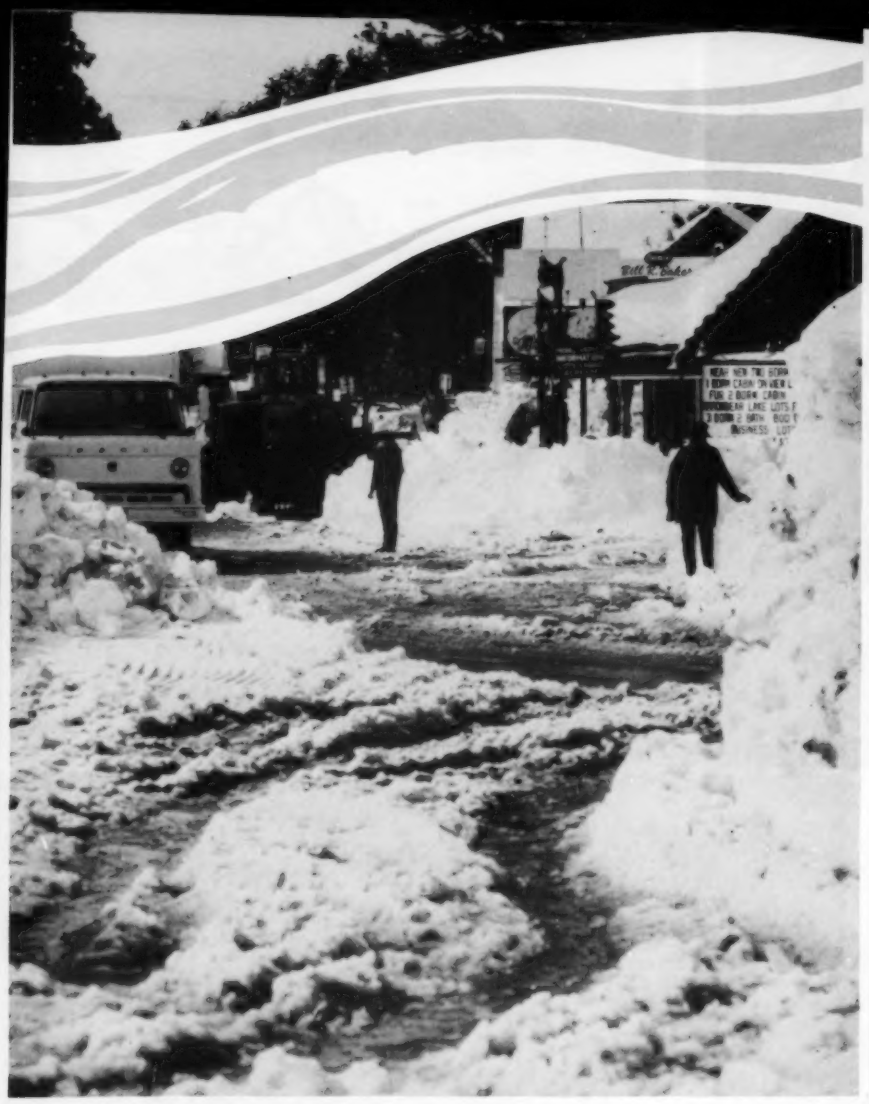
Sliding through the season: Suppose, through no fault of your own, you go into a skid. It often happens – a spot in the road is icier than the rest or something. First thing is to keep your head. Most skids aren't too serious, especially if you're going slowly like we told ya.

You need to get out of the skid as quickly as you can, to regain control, and to avoid going off the road or hitting something. And what's the quickest way? By slowing down, of course. You knew it all the time, didn't you?

What is happening during a skid is that the rear wheels are trying to overtake the front – basically you were going too fast for conditions. So take your foot off the accelerator. The rear wheels will slow down. Then you steer *into* the direction of the skid. If the tail of your car is going to the right, steer to the right. If it's going left, steer left. If more slowing action is necessary to get out of the skid, pump the brakes lightly. Once you're straightened out you can go on – hopefully with more caution.

Those of you with front wheel drive autos have already seen a problem here. If you take your foot off the gas, your drive wheels will slow down, but your rear wheels will still be going the same speed, and you might make the skid worse. The steering into the skid method is the same, but you front-wheelers should speed up just a *little*, to keep the rear wheels behind you. Or else take the car out of gear entirely. Once you're back in control, you can slow down to a safer speed.

Skids can occur rather unexpectedly after most of the snow and ice have melted away. This is due to patches of ice that remain in places that receive no sunlight – in the shadows of buildings or trees, or beneath overpasses. When you see one of these areas coming up, slow down while you're still on dry pavement and coast through the shadowed area with the car in gear. Then speed up again after you're past the shadow. Maybe there'll be no ice, but the smart money says there will be.



Snowed in: Getting yourself stuck in the snow can make you wish you lived in Florida, so the best move is not to get stuck. If, however, you manage to do it anyway, don't lose your temper. If you're stuck in a drift or very deep snow, you've got no option but to dig yourself out.

If it's just deep enough so your wheels are spinning rather than moving the car, you can usually get going by rocking the car. By this we mean easing the car forward and then switching to reverse to ease backward, and repeating the procedure until your wheels catch on something a little more solid.

This obviously has limited application in traffic where you might back into someone, but in traffic you might get someone to push you out, which is a dandy way to handle the problem.

If there's nobody around and rocking the car doesn't work, it's time to get in the trunk for the shovel and the sand.

Well, that's about it for this winter, gang. The best advice we can give you is this: Whenever winter conditions mess up the roads, decide very firmly that you are in no hurry. Decide that you have all the time in the world and it doesn't matter when you get there. Impatience is one of your biggest enemies. If you're going to be slowed down – and winter'll do that – resign yourself and concentrate on safe, cautious driving. Relax, and take your time. You can't control the weather, and you can't control the other drivers. All you can control is your attitude and the manner in which you drive. But, when you think about it, that's quite a lot.

HOW IT HAPPENS

Sergeant Frank Sandbeams is traveling down the boulevard in his new British sportscar. It's so new the odometer still reads in two digits. A fellow in a four-wheel-drive vehicle on his left signals for a lane change and performs said lane change, despite our hero's anguished horn-blowing. The little sportscar is hit and knocked over into a parked car by the curb. Sgt Sandbeans is securely belted-in and uninjured, but his car will never reach the 17-mile point.

Sgt Sandbeans should:

1. Scream and curse.
2. Buy only a large, American car.
3. Drive his sportscar on the sidewalk.

Would you believe "none of the above"? Sure you would. Little cars have just as much right to the road as the big tank-sized jobs. But they aren't as visible, especially for motorists in high-slung vehicles like the four-wheeler, or a bus. Sandbean's got to look out for himself, because a lot of times no one else will.

Camaro Berlinetta is the top of the Camaro line. Z28, Rally Sport, and Sport Coupe complete the lineup.

(far left)
Mercury Capri R/S will be made in the States from now on, shares suspension components with new Mustang.

(near left)
Buick Riviera has front wheel drive, turbocharged V6 as standard engine.

(far left)
Road Hawk by Buick has front air dam, rear spoiler, new paint stripe treatment. Car is scheduled to go to front wheel drive in '81.

(center left)
AMC Concord 4-door. Luxury and economy in the same package from the American Motors small car experts.

(near left)
Century Custom Coupe from Buick has turbocharger option, excellent visibility from large rear-quarter windows.

(left)
St. Regis is top of the line for Dodge, shares modified Cordoba chassis with New Yorker and Newport.

it's gonna be fine in '79

The dinosaurs are gone from the garage. Taking their place are smaller, safer, more fuel-efficient cars and trucks that should last longer and require less maintenance.

Even though this year's crop of new cars includes features like larger taillights, brighter headlights, and increased passenger protection, major engineering emphasis has been shifted from safety to fuel conservation. The great strides in automotive safety we've witnessed in the past few years have accounted for a good deal of progress in keeping us safe on the highway, but, economics being what they are, the manufacturers now must concentrate on fuel economy in order to have some products to sell in the coming years.

Although the air bag appears to have taken a back seat, passive restraints (fixed seatbelts) are making inroads and we applaud their appearance on the scene. The new halogen headlights are a step in the right direction too.

Ford's serpentine engine drive belt (one belt drives all engine accessories) is one of their better ideas, and the Chevrolet F-41 and 9C-1 handling packages make the Caprice, Malibu, and Nova handle like expensive imported cars long noted for their good road manners.

So, while the '79 cars are probably the best to ever come out of Detroit, safety has taken a slightly lower profile in the marketplace. It's still up to you, the driver, to control driving situations. The cars will only do what you make them do.

Drive safely, and it'll be fine in '79.

continued

golden eagle

AMC

1979

it's gonna be fine in '79

continued

(far left)
CJ-7 Golden Eagle Jeep from AMC has hard roof, hatch, good rearward visibility. AMC is opening a new plant to keep up with the demand for Jeeps.

(center left)
Mercury Grand Marquis saves 10 inches and many pounds over last year. Base engine is 351 cid V8, the 400 and 460 V8s having gone out of the lineup.

(near left)
Horizon by Plymouth, in TC3 hatchback form here, also comes in 4-door style.

(far left)
Malibu Black Sterling is an ideal car for '79. If public response is large enough, Chevy might put it into production.

(center left)
AMX from American Motors is good combination of small size and sporty looks.

(near left)
Dodge Magnum XE sports optional T-bar roof and two-tone paint. Special GT package will also be available.

(far left)
Spirit is new this year from AMC. Lift-back model appears to be excellent for economy-minded families.

(center left)
Turbo Cobra from Mustang should be hot seller. Turbo'd 4 cylinder engine and TRX handling package make the best Mustang in many years.

(near left)
Challenger, Dodge Colt's sports car, offers seating for four and a fuel-saving 1600 cc or powerful 2600 cc engine.

(far left)
Even the police are looking for efficiency these days. Dodge Aspen is small externally, uses 360 cid V8 instead of ground-pounder 440.

(center left)
El Camino Royal Knight option includes triple-tone striping and dragon-style decals on hood. Base engine is Chevy's proven 3.3 litre V6.

(near left)
Mustang is all new for '79. *continued*

Firebird Trans Am, Pontiac's hot seller, gets new super-swoopy nose job, restyled tail. We're happy to see the return of large, highly visible taillights on many of the new models.

(above top) **Ford LTD** Landau 4-door is down-sized on the outside, retains room of previous models. (above) **LTD** two-door sedan sports Granada-like roof, single rectangular headlights.

Champ from Plymouth has front-wheel drive and transverse-mounted engine, comes in this hatchback style.

Chrysler New Yorker has new 118.5 in. wheelbase and hideaway headlights. Base engine is 318 cid V8.

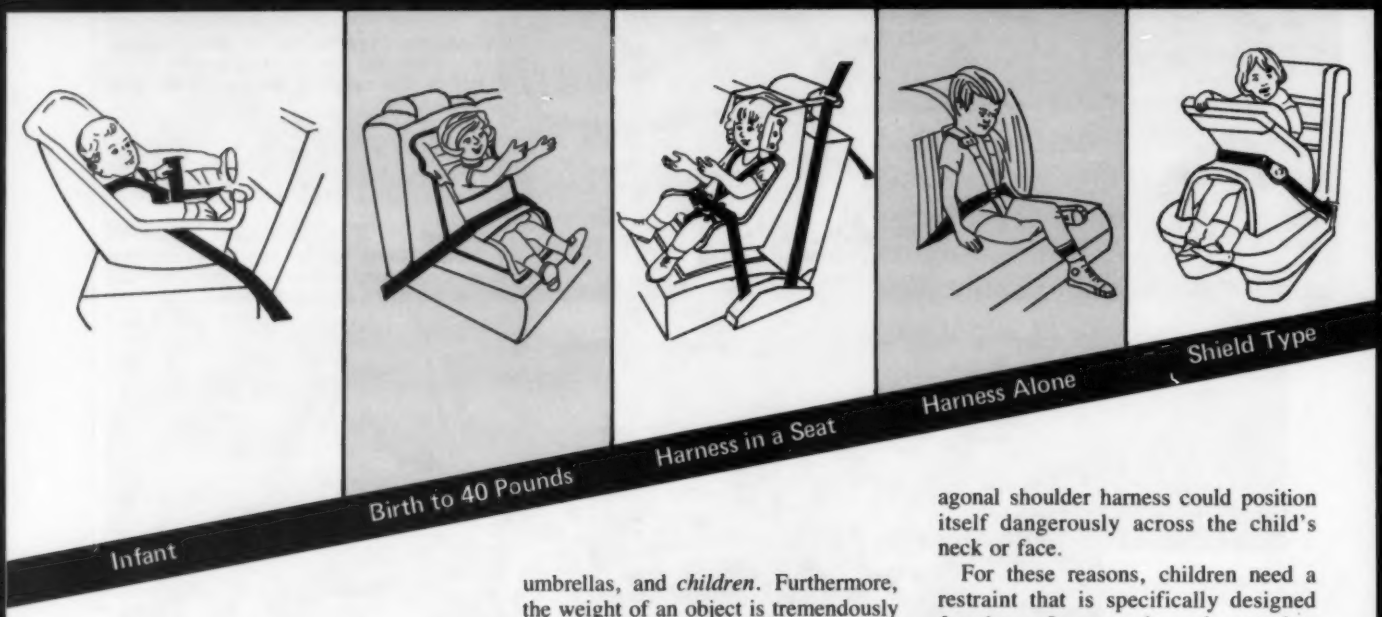
continued

Caprice Classic has full-width taillights this year, and the standard engine is 4.1 litre L6. 2:56 rear axle ratio gives better mileage.

(below)
Monte Carlo has 3.3 litre V6 as standard engine, with optional engines going from 3.8 litre V6s to 4.4 and 5.0 litre V8s.

Corvette's 26th edition has refined handling, performance, and power for '79. 5.7 litre V8 is standard, and automatic transmission-equipped models get better performance by axle ratio change from 3:08 to 3:55.

MA-MA, DA-DA



Are you subjecting your child to needless danger when traveling in the family car? Many parents are. Only you can make sure your child is properly protected.

The problem: Auto accidents are the number one cause of death among children, claiming more lives than drowning, poisoning and childhood diseases. Each year nearly 1,000 children under the age of four die as passengers in auto mishaps; thousands more are seriously injured, sometimes permanently.

The cause: The cause of this alarming statistic is neglect. Many parents do not take the necessary precautions to safeguard their children while traveling. A study conducted by the Insurance Institute for Highway Safety showed that 93 percent of the children they observed were not riding buckled up in the car. Another one percent were restrained by inadequate or unsafe devices.

Many parents do not realize the force involved in a crash. Any loose object in a car will fly about in a collision or hard stop, causing damage to itself and anything or anybody with which it collides. This includes groceries, books, umbrellas, and *children*. Furthermore, the weight of an object is tremendously increased by the force of a crash. For instance, in a collision at 20 miles per hour, a 30-pound child becomes like a 600-pound forward flying missile, hurtling into the dashboard.

The solution: Simple. Just buckle infants and toddlers into *crash-tested car restraints* during every trip in a car. Studies have shown that the use of car restraints can prevent death and greatly reduce injury to children in crash situations or during sudden stops.

Why not seat belts? Although they're life-savers for grownups, the seat belts and harnesses that come as standard equipment in new cars are not suitable for children under four, or for children weighing less than 40 pounds.*

It's wrong to think of a small child as a miniature adult. A child's head is much heavier and larger, in proportion to its body, than an adult's. It is supported on much weaker neck muscles. A child's bone structure is softer, still forming. A child can slip through or "tunnel under" a standard safety belt in a crash or sudden stop and the diagonal shoulder harness could position itself dangerously across the child's neck or face.

For these reasons, children need a restraint that is specifically designed for them. In general, such restraints should:

- Distribute the pressure of the body over the largest possible area;
- Provide good support for the head and neck to guard against whiplash injury;
- Be secured by either a standard lap belt through or around the child restraint or anchored directly to the floor of the vehicle.

Availability: A few years ago, parents could use the excuse that adequate restraints were not available for children. This is no longer true today. More than 20 different models that meet crash-testing standards are now sold by retail, discount and juvenile product stores, catalog outlets and car dealerships.

When shopping for an approved crash-tested device, keep in mind that they fall into five groups:

Infant – Baby rides backwards in a semi-reclining position. This type of restraint is suitable for infants up to 20 pounds.

Birth to 40 Pounds – Restraints of this type are suitable for infants when placed in a backward-riding position. For the toddler and older child up to 40 pounds, these tilt up and face forward.

*Lap belts buckled snugly, low over the hips, should be used when no crashworthy child restraint is available. They provide better protection than many other seats which do not pass dynamic crash tests, and they are much better than allowing children to travel unrestrained.

RESTRAINING your child

by U.S. Department of Health, Education, and Welfare

Harness in a Seat – The chair type restraint must have a 5-point harness. That is, one that comes across the lap, over both shoulders and through the crotch. This type is suitable for children who are able to sit up unaided and who weigh at least 15 pounds. They can be used until 4 years or 40 pounds.

Harness Alone – This is a 5-point harness which is secured by a strap around the seat back and is bolted to the floor or to the rear window shelf. It will fit a child who can sit up unaided and weighs 15 to 50 pounds.

Shield Type – Children weighing over 20 pounds can use a restraint featuring a curved C-shaped shield which is secured by the standard safety belt. Some infant restraints have their own individually designed shields which snap on when the restraint is faced forward for use by an older child.

Buying Guide: The question: to buy or not to buy, should be settled with this warning. OLD SEATS WHICH MERELY HOOK OVER OR UNDER THE PASSENGER SEAT DO NOT PROTECT. THEY SHOULD BE DESTROYED, NOT HANDED DOWN, MUCH LESS PURCHASED.

When purchasing a car restraint, be sure to consider the size of both your child and your car. Some restraints in the backward position may not fit in the rear seat of compact cars. In a few instances, it has been found that the adult safety belt is not long enough to buckle around the restraint. If this is the case with your car, you may have to shop around to find a suitable model of restraint, or purchase a seat belt extender from a car dealership.

The idea being you want that youngster to GROW UP.

Tiny infants may require additional padding to prevent their flopping from side to side while traveling in a car restraint. Receiving blankets can be rolled up and tucked on either side of the infant to provide this additional support. Check with your doctor for advice or be sure to read the manufacturer's specifications.

Proper use: If car restraints are to give protection, they must be used properly during every trip in the car. This means that the restraint must always:

- Be securely fastened by the adult's safety belt;
- Tether straps, if provided, should be tightly fastened;
- All other manufacturer's instructions should be followed.

If the restraint is in the rear seat, anchor the top tether strap to a bolt into a metal portion of the rear window shelf. If the restraint is in the front seat, anchor it to a rear seat safety belt. In station wagons and vans, anchor the top strap to the cargo compartment floor at a 45° angle or greater. A restraint with a tether could be very hazardous if the strap is not used.

The back seat of the car is safest, unless the driver must supervise the child closely. The center of the seat is preferred.

Never fail to buckle up your infant or pre-schooler – even on short trips around town. Most accidents happen within 25 miles of home at speeds less than 30 mph. It may be inconvenient to buckle and unbuckle your child while running errands to the super-

continued

market, drug store, doctor, library, grandma's, etc.—but the few seconds it takes to secure your child could save you countless hours of grief and worry, not to mention medical bills and time spent at a hospital emergency room.

Traveling with less hassle: In addition to safety, car restraints do have a convenience factor. They can save the driver from the distraction of children climbing over the seats, bouncing around, or rough-housing. The driver can concentrate on driving and not worry about grabbing for falling children.

Your attitude as a parent will have a lot to do with how well your child adjusts to the car restraint. If a restraint is used from birth it becomes a natural part of riding in the car for the child. It can become "his own territory," and the start of a life-time habit of using safety belts after outgrowing the infant and toddler seats.

A child who is not used to riding in a restraint may throw a tantrum, but this can be dealt with firmly and positively. When a child fusses about the car restraint, the parent should make it clear that "I can't drive standing up, and you can't ride standing up. The seat or harness is to protect you if I have to stop too fast." If the tantrum persists, stop the car when you can do so safely and be sure there is nothing else disturbing the child. Here are some other tips to make the car restraint more pleasurable for children:

- Provide books, crayons, and soft, cuddly toys to keep them occupied;
- Entertain them by naming animals and letting them make the sounds for the animals.
- On long trips, try to stop every hour for a stretch break. Place infants on their tummy for a change of position and let preschoolers run and jump for a brief period.

Most important is your own example. Everytime you buckle up, your child learns a valuable lesson.

Other considerations: Can a parent and child use the same lap belt?

No, the weight of the adult's body could crush the child in a collision.

Can two children use the same lap belt?

No, it makes proper fit impossible, and the weight of one child might contribute to injuring the other child.

Is an infant safe in an adult's arms?

No, the jolt of the stop or collision can wrench the child out of the adult's grip. An unbelted adult may also crush the child between himself and the dashboard.

Can a pregnant woman wear safety belts?

Yes, pregnant women should always wear a safety belt and shoulder harness, but the lap belt should be positioned as low as possible across the hips, below the baby.

Do car beds provide crash protection?

No, car beds do not prevent the child from being thrown about in a collision or sudden stop.

Will air bags protect children?

Tests have shown that air bags will provide adequate protection if used in conjunction with car restraints. Without restraints, infants can slide under the airbag and older children, if standing, could be thrown out the side or back window.

Spreading the message: If this article has convinced you of the critical need for using car restraints for children, why not spread the message?

Pass this article on to a friend who has small children.

Encourage local service or civic clubs to schedule speakers on this topic for one of their meetings.

Suggest to appropriate health care providers that educational materials on this topic be provided through prenatal classes or to new mothers in the hospital.

Enlist the support of a local organization (hospital auxiliary, wive's clubs, or other group) to sponsor a public service campaign on this topic in your area. Appropriate activities would be radio and TV public service spots, contacting merchants and car dealers to encourage them to carry and advertise the restraints, establish a loan closet of used restraints, and circulate the list of where crash-tested restraints can be purchased locally.

The agencies listed below can be used as resources for any of these activities.

Resources: To obtain a list of crash-tested child and infant car restraints currently on the market, write for these brochures:

"Don't Risk Your Child's Life," Physicians for Automotive Safety, 50 Union Ave., Irvington, NJ 07111 (include 25 cents and a stamped, self-addressed envelope).

"This Is the Way the Baby Rides," Action for Child Transportation Safety, 400 Central Park West, #15P, New York, NY 10025 (include 25 cents and a stamped, self-addressed envelope).

"Childsafe," Wisconsin Hospital Association, P.O. Box 4387, Madison, WI 53711 (include 25 cents and a stamped, self-addressed envelope).

The above organizations also offer films, slide programs, posters, other brochures, bumper stickers, and a variety of additional materials on the topic of car safety restraints.

Timely Topics

COLD WEATHER TIP . . . ADDING WATER TO BATTERIES

According to Champion Spark Plugs' fine tech brief, *The Service Corner*, a certain amount of battery water is lost during normal use . . . some to evaporation . . . most due to the action of the battery during charging cycles. When the electrolyte (fluid) level is found to be low, the normal routine is to add water.

This is fine; however, if the ambient temperature is at or below freezing, be sure the car is then driven sufficiently to mix the water with the electrolyte. Fresh water will tend to lay on top of the electrolyte and could freeze at 32 degrees F (0 degrees C).

In the chart below, notice that a fully-charged battery is not likely to freeze. But if it's only half-charged . . . look out! With temperatures in many parts of the country running normally around 12 degrees F during the winter, you people stationed in the northern tier bases should pay close attention to that overworked battery.

State of Charge	Specific Gravity	Freezing Point
100%	1.260	−70°F, (−56°C)
75%	1.225	−36°F, (−37°C)
50%	1.190	−12°F, (−24°C)
25%	1.155	+3°F, (−16°C)

YOUR CAR IN WINTER

Have trouble starting your car in cold weather? Maybe you're not doing it right. There's a lot of well-meant but very wrong advice handed out on the subject. By all means check your owner's manual.

Most late-model American cars are started by depressing the accelerator once (twice, below 0°F), lifting the foot all the way back off the accelerator pedal, then turning the key. The engine should start within seconds. Pumping the accelerator pedal keeps many a driver from getting a quick start on a cold morning. Halfway down is OK when restarting after the engine is warm—but never when it's cold.

Remember, if you aren't sure about how to start your car, look in your manual.

When the weather is very cold, try to avoid short trips (less than a mile) because the battery discharges more than the charging system can put back, and other mechanical parts will not warm up adequately.

Once started, *drive* the car moderately to warm up moving parts. Just letting the engine run wastes gasoline and doesn't warm up the other mechanical components.

After several weeks of cold weather and many short trips made with lights, heater and radio on, take the car for a longer drive (20 to 25 miles).

COST OF DRIVING

A used car driven 10,000 miles a year for three years can be approximately half as costly to operate as a new car under the same condition, a nationwide study shows.

The Hertz Corp. found in a study the cost of keeping a used car on the road for three years averaged 17.3 cents per mile compared with 30.1 cents for a new car.

"As with a new model, the longer a used unit is kept, the less expensive per mile it becomes to run," the car-rental firm said.

The cost survey included such expenses as depreciation, fuel, insurance, maintenance and repairs, the company said.

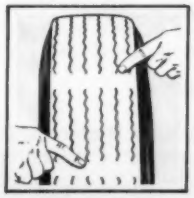
The study said in effect that if you want to strike a reasonable balance between a desire for the newest used car you can afford and a desire to reduce ownership and operating costs as much as possible, it is best to buy a used car when it is three to four years old.

TIRE TREAD CHECK TIME

Now that you've had your vacation and probably have driven several hundreds of miles, maybe even a few thousand, it's time to check the tread on your tires. It may be time to replace the tires on your car.

There are two ways to tell when it's time to re-tire. Some tires have built-in "wear bars" which appear as smooth bands across the face of the tire when only 1/16-inch of tread remains. You can also test tire tread by inserting a Lincoln head penny in the tread groove. You do this by holding the penny at Lincoln's neck and inserting the top of the penny into the groove. If the top of Lincoln's head shows, tread is worn below 1/16-inch, the danger line.

It makes no difference what year the penny was made because you are using the Lincoln head side of the penny for the test.



"Wear bars"

Abe's dome

STRANDED MAN DIES FOR LACK OF WRENCH

A felt-tipped pen was used to scrawl along the hood of the car, "bad water, wrong lug wrench."

The body of an elderly man was found in the car. He had been dead about three days when he was found.

The man was en route from Las Vegas to Los Angeles when he drove off the main highway and onto back desert roads in the restricted U.S. Navy's Weapons Testing Center at China Lake.

The car had a flat tire and the man was apparently unable to fix it because he did not have a lug wrench the right size to remove the damaged tire.

Police said he was believed to have been stranded in the desert about a week before he died. Two coolers which had contained beer and soft drinks were empty.

Authorities said he apparently had driven about 60 miles along back desert roads before the tire went flat. There was a fully inflated spare tire in the trunk of the car, authorities said, but no wrench to fit the tire lugs.

DOUBLE CLUTCH

continued from page 2

same beam by hand on a Morgan can cost $500.

Safety standards are only half of it. The car also must comply with federal smog control standards. If the car is to be registered in California, standards are even tougher. You may be looking at a major engine modification and addition of a catalytic converter.

Once that work is done, the car must pass the same test which the Environmental Protection Agency (EPA) requires of new cars every year. Tests cost between $500 and $1000 each and some cars have to be tested several times. Remember, this is the same test for which the car manufacturer uses a brand new, carefully tuned, hand-assembled prototype.

So what happens to the poor innocent who didn't know what he was getting into when he bought the car overseas? If he can't afford all this, can he sell the car? No. If he cannot bring it into compliance, he must send it back overseas or have it destroyed.

The EPA gets so many complaints from people who are miserable, frustrated and shocked after bringing in a non-complying car that the Agency may ask for a government ban on importation of vehicles which don't meet safety and emission standards. Canada has already done so.

JACK

Hollywood #646 Hydraulic floor jack

Hydraulic floor roller jack model 646

Hydraulic floor jack K-P—#Z2150

Model 6300 hydraulic floor jack

Spartan model H-1 hydraulic floor jack

Possibility that jack will fall when off center loading is made on saddle. This failure occurred when test load was placed on lip of saddle under loads exceeding 2,700 pounds. (Correct by replacing with new improved jack that meets requirements of specifications.)

AMERICAN MOTORS

1975 Gremlin

1976 Hornet

Mfg. Campaign No. NR. System-Power steering/hose. Possibility that power steering hose was routed close to exhaust manifold. If this condition exists, hose may deteriorate from heat of exhaust manifold and fail. (Correct by rerouting and replacing hose where necessary.)

CHRYSLER

1976-1977 Plymouth Volare

1978 Dodge Aspen

Mfg. Campaign No. 254. System-Suspension. Possibility that front suspension pivot bar support plate may experience fatigue due to high torque transmissibility load inputs on pivot bar bushings under severe service conditions. If plate failure progresses through pivot bar mounting hole, vehicle directional control may be adversely affected. (Correct by inspecting and installing reinforcement brackets on front suspension pivot bar support plates.)

1978 Dodge Omni

1978 Plymouth Horizon

Mfg. Campaign No. 255. System-Suspension. Possibility that front suspension control arm to ball joint rivet attachments may not be of sufficient strength to withstand high impact loading such as that resulting from wheel hitting a chuckhole at relatively high speed with brakes locked. Failure of rivets may adversely affect vehicle directional controllability. (Correct by installing bolt and nut attachment midway between two rivets.)

1978 Plymouth Horizon

1978 Dodge Omni

Mfg. Campaign No. 257. System-Fuel/hose. Possibility that fuel hose may come in contact with air conditioning suction hose. If this condition exists, abrasion by the air conditioning suction hose could cause a leak in fuel return hose and result in possible underhood fire. (Correct by inspecting and rerouting hose to preclude contact.)

FORD

1976 Pinto

1976 Mercury Bobcat

Mfg. Campaign No. NR. System-Fuel/leakage. Possibility that vehicle may fail to meet requirements of 30 mph frontal barrier impact test as specified in Federal Motor Vehicle Safety Standard No. 301. Failure may result in fuel leakage in engine compartment in excess of that permitted by Standard No. 301. (Correct by installing front bumper bracket extension plates to comply with Standard No. 301.)

1978 Thunderbird

1978 Ford 4-Dr station wagon

1978 LTD II 4-Dr

1978 Mercury Cougar

Mfg. Campaign No. 289. System-Seat belt/retractors shoulder. Possibility vehicles manufactured with American Safety Equipment Corporation front outboard seat belt assemblies may be equipped with shoulder harness retractors that may not lock, with result that upon sudden vehicle deceleration or impact, outboard front seat occupant may not be restrained by shoulder harness portion of three-point seat belt system. Also, in some cases, shoulder harness retractors may not allow extraction of shoulder belt webbing due to pre-locked condition. Further, these conditions could cause retractors not to meet emergency locking retractor performance requirements of Section 4.3 (j) of Federal Motor Vehicle Safety Standard No. 209 or seat belt assemblies equipped with such retractors not to meet assembly performance requirements of Section 4.4 (b)(2) of Standard No. 209. (Correct by inspecting and replacing seat belt assemblies.)

1971 1972 1973 1974 1975 1976 Ford Pinto

1975 1975 Mercury Bobcat

Mfg. Campaign No. 293. System-Fuel/tank. Possibility that fuel tanks and filler necks installed on these vehicles are subject to failure when vehicles are struck from rear. Such failure can result in fuel leakage, which in presence of external ignition sources can result in fire, and "based on our investigation, it has been initially determined that defect which relates to motor vehicle safety exists in these 1971-1976 Ford Pintos and 1975-76 Mercury Bobcats (except station wagons)." (Correct by replacing existing fuel filler pipe and seal with longer pipe and improved seal. Also, install polyethylene shield on front of fuel tank.)

RECALL CAMPAIGNS

The National Highway Traffic Safety Administration (NHTSA) has issued a list of automotive and automotive product recalls for the period ending 30 June 1978. If you have a car or a floor jack listed among the following, and you haven't received notice of recall, get in touch with NHTSA by using their hotline number, toll free, (800) 424-9393 (for Washington, DC residents the number is 426-0123).

1978 Ford Fairmont

1978 Mercury Zephyr

Mfg. Campaign No. 294. System-Transmission/shift linkage. Possibility that vehicles equipped with automatic transmissions and steering column-mounted shift controls were produced with transmission shift control rods which were intended for use with steering columns of prior design level. Attachment of shift control rod within steering column shift lever grommet will allow relative movement between these parts and result in grommet wear that could, with use, deteriorate shift control function with potential for starting in gear or inability to engage "Park" position. If condition were to occur on vehicle in which driver had not engaged parking brake, vehicle movement may be initiated and may cause property damage or personal injury. (Correct by inspecting and replacing transmission shift linkage parts.)

1978 Ford Fairmont

1978 Mercury Zephyr

Mfg. Campaign No. 295. System-Transmission/linkage. Possibility that vehicles equipped with automatic transmissions and steering column mounted shift controls were produced with revised design shift controls which can contact intermediate fuel hose. Specifically, new bellcrank support bracket can contact fuel hose and cause abrasive damage that may result in fuel leakage and possible accumulation of fuel on surface beneath parked vehicle. If source of ignition were present, potential fire hazard may exist. (Correct by inspecting and replacing transmission shift linkage parts to preclude fuel hose abrasion.)

GENERAL MOTORS

1978 Chevrolet G20/30

1978 GMC G20/30

Mfg. Campaign No. 78C13-78C-08. Systems-carburetor Fuel pipe. Trucks. Possibility that there is an interference condition between carburetor fuel pipe assembly and air-conditioning bracket. This condition may cause pipe to wear through at high mileage due to vibration and fuel pressure pulsation. If this condition occurs, it would allow gasoline to leak from fuel pipe assembly, resulting in possibility of fire in engine compartment. (Correct by inspecting and relocating fuel pipe to eliminate interference.)

1978 Chevolet Malibu, Monte Carlo

1978 Pontiac LeMans, Grand Le Mans, Grand AM

Mfg. Campaign No. 78C16-78C-8. System-Head restraints. Possibility that head restraint installed on front bench seats were incorrect and fail to conform to Federal Motor Vehicle Safety Standard No. 201. In event of accident, incorrect restraint could result in rear seat passenger's head impacting front seat head restraint, causing head injury to rear seat passenger. (Correct by inspecting and replacing with new type head restraint.)

1959 1960 Cadillac All

Mfg. Campaign No. 60-C-1. System-Steering/pitman arm. Possibility that pitman arm can separate and result in loss of steering control. (Correct by replacing original pitman arm with new one.)

1977 Chevrolet Monte Carlo, Malibu

1977 Pontiac LeMans, Grand Prix

1977 Oldsmobile Cutlass

1977 Buick Century, Regal

Mfg. Campaign No. 77C26. System-Axle/shaft. Possibility rear axle shaft may have flaw in metal. As a result, shaft may break, which could allow tire and wheel assembly to separate from vehicle. (Correct by inspecting and replacing axle where necessary.)

1978 Chevrolet Malibu, Monte Carlo

1978 Pontiac Catalina, Bonneville, LeMans, Firebird, Phoenix

1978 Oldsmobile "88", Cutlass, Omega

1978 Buick LeSabre, Electra, Century, Regal, Skylark

1978 GMC Spirit

Mfg. Campaign No. 78C15. System-Cooling fan/hub. Possibility fan blade spider (hub portion) may fatigue and break apart, allowing two-blade segment to be thrown off. Spider fatigue occurs as result of excessive stress experienced under certain conditions such as wide open throttle second to first gear down-shift when fan clutch is disengaged. Excessive stress is experienced during these conditions only when there is sufficient axial run-out of water pump hub to cause wobble-type response of fan, which induces resonance condition. (Correct by inspecting and replacing fan blade assemblies with improved type.)

1975 1976 MG Midget

Mfg. Campaign No. B074. System-Fuel/pipe bracket. Possibility exists of misalignment of fuel pipe mounted on cylinder head rear stud. If this condition occurs, it may result in damage to fuel pipe with fuel leakage under hood. (Correct by inspecting and properly aligning bracket mounted on cylinder head rear stud.)

1975 1976 1977 1978 MG MGB Roadster

Mfg. Campaign No. B061. System-Accelerator/cable. Possibility of gasoline leakage from carburetor at point of float chamber gasket. (Correct by inspecting and replacing carburetor float chamber gasket with one of increased width.)

THE BACKYARD MECHANIC . . .

DO YOU REALLY NEED A BIGGER HAMMER?

part 2 basic DENT removal

So there you are in the parking lot, sadly surveying the job the Dent Phantom did on your car. You can just see yourself cruisin' down E street trying to look good, and everybody is pointing to your car and saying, "Ayyyyy, look at the dent in that car, man" . . . not exactly what you had in mind, is it? Right away you figure that dent has got to go.

But how to go about it? Well, you can take it to the body shop, but you figure that'll take up the best part of a C-note without leaving you change enough to hit the Burger Queen. You could get your best friend's second cousin to work on it, but then you remember that the last time you saw the guy he was trying to walk and chew gum simultaneously . . . and not doing very well.

That leaves you just one option. Get a hammer and dolly block, some plastic filler and sandpaper, and do it!

Think about the dent: The first thing to do after you've emotionally prepared yourself to unbend some metal is to look at the dent and see if you can visualize how it was formed. If you can see how it was formed, you can reverse the procedure to get the dent out. Sometimes what appears to be the biggest part of the dent is only the result of what happened as the dent was formed. When you remove the crease, for instance, that actually resulted from the main impact, the areas near that will magically pop out, too. If you carefully observe the damage first, you can avoid doing additional damage caused by working on the wrong portion of the dent first.

Two basic techniques: There are two basic types of hammer and dolly block techniques. They are hammer-on-dolly and hammer-off-dolly. *Hammer-off-dolly* is usually the easiest to learn for beginners. The dolly block is positioned *next to* where the hammer will strike the work. The force of a hammer blow to the surface will cause the dolly to bounce or rebound back onto the rear surface of the work. What happens is that this trick will cause a low spot to be driven up with the dolly rebound, and a high spot to be driven down by the hammer force, all with a single hammer blow.

If you use the dolly block as an anvil, this is called *hammer-on-dolly* work, since you place the dolly directly *behind* the area you wish to attack. This hammer-on-dolly method should probably be used sparingly by beginners because it can cause the work (sheet metal) to stretch. Stretched metal will have to be shrunk with heat and beginners would be well-advised to avoid problems like this.

The actual technique of using a combination hammer isn't quite the same as swinging your dad's old carpenter hammer. The dinging hammer should be held close to the end of the handle, but with a fairly loose grip. It is swung with wrist action so that the hammer can lightly bounce off the work. Hard blows will only work-harden the metal or cause new dings by forcing the metal out of shape. So, the word is to use lots

continued

(near right)
Hammer-off-dolly technique used by most beginners. Hammer is placed adjacent to dolly. Hammer strokes lower high spots, rebounding dolly works on low portion.

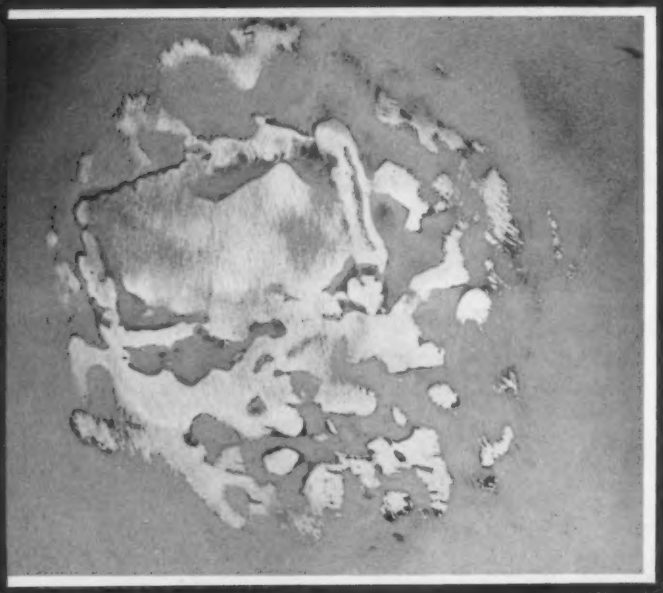
(far right)
Hammer-on-dolly uses hammer in line with dolly block. Dolly forms anvil for flattening wrinkles, but metal may stretch with this method.

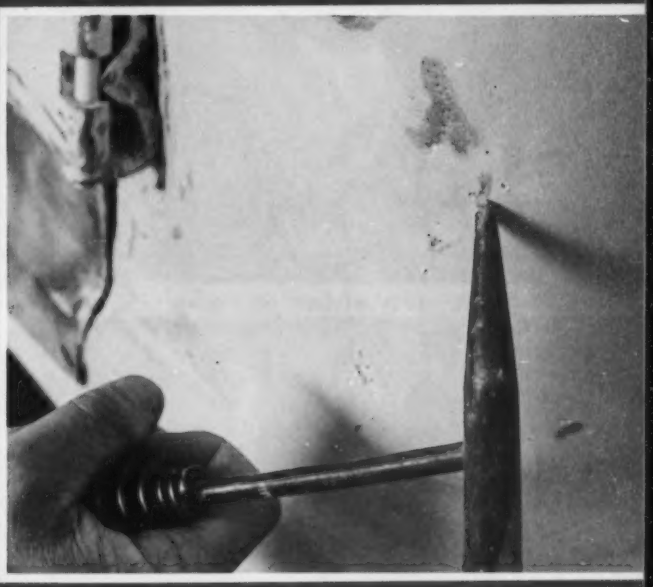
(near right)
After Hammering, spray a coat of primer and then sand lightly. High spots show shiny, lows contain primer.

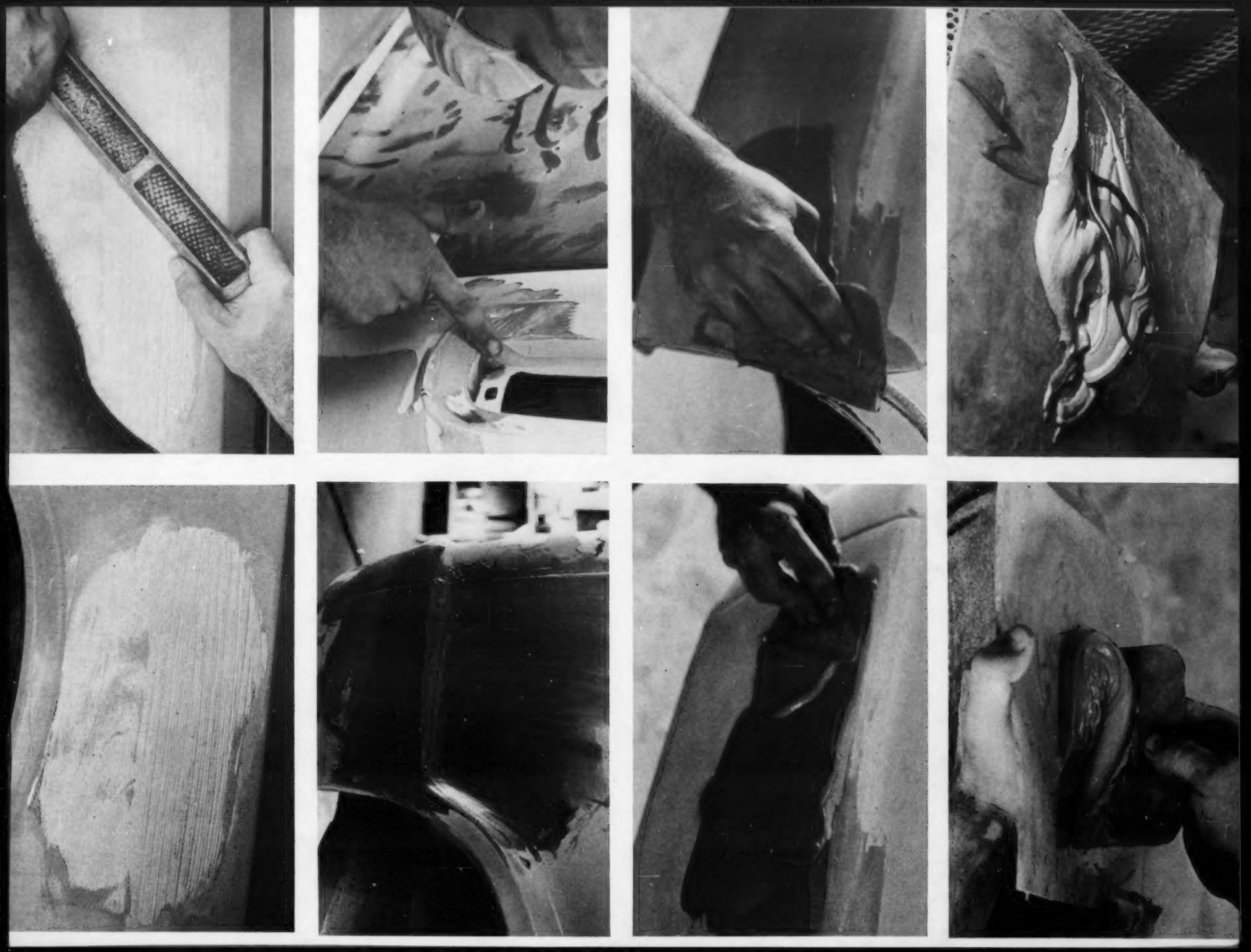
(far right)
Pick hammer is used to ding down high spots.

(near right)
Rear view of fender shows proper pick hammer technique . . . use many little strokes, not several big ones.

(far right)
Get your squeegee ready by scraping off old plastic with knife. The smoother the squeegee edge, the smoother your filler will be.







(far left)
Mix the plastic filler on a piece of clean cardboard or a piece of safety glass (with taped edges). Text tells correct color for good mixture.

(near left)
Make sure plastic filler is thoroughly mixed. If catalyst isn't fully mixed, portions of the filler will never harden.

(left)
Apply filler material using as few strokes as possible. One long stroke is better than several short ones.

(far left)
While filler is still soft, a finger is a good way to contour those complicated areas. This will save you a lot of time at the grinding/sanding stage.

(near left)
Hardened filler should follow contours of the area to be repaired.

(far left)
Use "cheese grater" at an angle to the work. This makes it cut faster and easier.

(near left)
Comparison of grated vs. sanded area.

of little, light blows rather than your best King Kong imitation.

The pen is mightier . . . After you've scoped out the way the dent was formed and the order of the blows necessary to remove it, spray on a bit of light-colored primer and take a felt-tip marker in your hot little hand. With the felt-tip, mark the high and low spots to be struck by using Xs and Os (or Qs and Ps . . . whatever trips your trigger). Draw arrows to indicate the edges of the dent and point them toward the center of the dent. This will give you a good picture of how to stagger your blows from one side to the other and from the top to the bottom of the dent. This will allow you to gradually reshape the metal without stretching it.

Make noise now: Attack the dent using the hammer-off-dolly technique, beginning with the hammer on the inside of the fender and the dolly on the outside. After the basic shape of the contour is worked out, swap the hammer and dolly positions, using the hammer on the outside surface. Work the dent out slowly, pausing often to check the contour with the palm of your hand. You'll be surprised at how accurate your palm can be. Your eyes will tell you that the surface is smooth, but your palm will tell you your eyes lie.

After the panel has taken its basic shape, lightly sand the area with a sanding block and medium sandpaper. Light sanding will reveal bare metal on high spots and leave paint in the low places. These lows can be brought up with the point of the combination hammer or filled with plastic filler if you don't trust your metal-working skills. You'll probably find that using the plastic will be easier for a beginner since it usually takes a great deal of experience to locate the low spot on the blind side of a fender and then strike it accurately.

Prepping for filler: All you macho dudes should like this part . . . the metal has to be *roughed-up* and all the paint removed preparatory to using plastic filler. The easiest way to do this is with a grinder or sander using open-coat discs of around 16-grit. Open-coat discs are preferred because they won't clog with paint or metal. It might also be a good idea to use a metal washing fluid (like Prepsall) to clean the surface of any grease or oil deposited by your greasy hands.

With the surface cleaned and ready, mix up a batch of filler according to the directions on the can. Remember, plastic filler will set-up (begin to harden) quickly, especially on hot days, so you have to work with a degree of rapidity (that's governmentese for "fast"). Most filler material consists of two parts, a base and a catalyst, or hardener. Mixed together thoroughly, the resulting material will usually be pinkish in color. If the color is too dark, that means the stuff will dry too quickly and crack. If it's too pale, that means the stuff won't harden at all . . . it'll just stay in a goop-like consistency that is thoroughly unpleasant to look at and work with.

Apply the filler with a large plastic (flexible) spreader. Put the plastic on smoothly and slowly, trying to apply no more than absolutely necessary. If you put too much on, it can sag before hardening, and it's just that much more to remove come sanding time. Also, try to apply the filler with the minimum number of strokes . . . the more you work with it, the more the chances of air bubbles in the finished material.

After applying the plastic, you can speed the drying process with a heat lamp, but this should be required only if the ambient temperature is pretty low. When the plastic attains the consistency of rubber, it's ready to be worked to a semi-final shape. Use a "cheese-grater" or Surform tool to shape the filler. Pull the grater in a diagonal manner to expose the greatest area of the file surface to the greatest amount of material. Go lightly here, because the grater will cut the plastic rapidly and you're gonna need some base material when you begin final sanding anyway. If a dark spot shows up, you'll know that it's a low spot and'll require more filler to level it up.

Shape-sanding: After you've established the semifinal shape with the

continued

grater, get out the air file (or long sanding block). Sand the areas lightly, using as much of the face of the sander as possible for a smooth finish. After the first coat of filler has been sanded, you'll probably need to apply a second, extremely thin coat of filler. Apply, file, and sand this coat as before, then cover the area with a heavy coat of primer. Sand once again.

Now you'll probably find very minor imperfections, like pinholes or minute low spots. These can be filled or covered with spot putty (also called lacquer putty). Lightly spread the spot putty over the entire area, but instead of making only a few passes, make a lot of passes with a flexible squeegee. This will both help to fill pinholes and speed drying. If you have the time, though, it's still wise to let the spot putty dry at least overnight. Sand the spot putty with very fine paper, preferably used wet to prevent the paper from clogging and putting in more scratches than you take out, and then final prime.

A one-hundred dollar dent can be worked out in about three hours by most amateurs, and if your calculator is charged up, that works out to a savings of about $33 per hour. That, plus the fact that now people won't laugh at your dent, should put a smile on your face!

Next month, paint: In the next issue, we'll cover (no pun intended) the subject of painting your steed. A word of warning though . . . you might as well begin preparing yourself emotionally for this task. Painting requires many things, but mostly it requires *patience*. So, keep a tight rein on your emotions. We promise that the wait will be worth it!

(far left)
Air file or sanding board is the most accurate way to sand large, uncurved areas. (Note our bodyman, Phil Knapp, uses a mask to keep dust out of his lungs.)

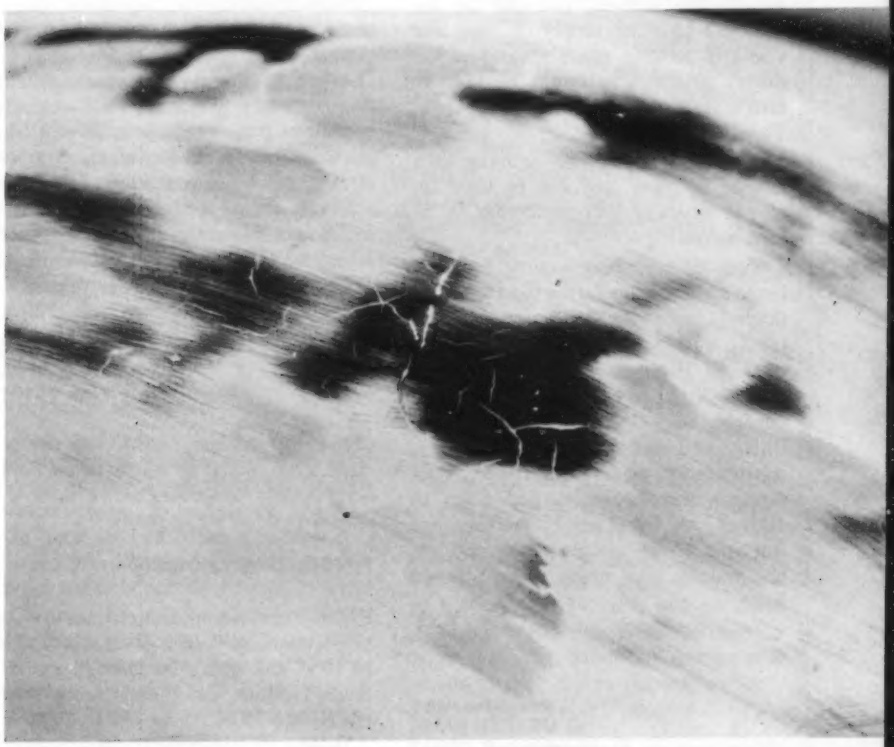
(near left)
The air file can also be used to contour areas by holding it at an angle to the work.

(far left)
Don't throw away that sandpaper when it's clogged. Try using a bristle or wire brush to clean it out first. It can save you some bucks in sandpaper costs.

(near left)
You'll find that your hand is one of the best ways to check an area for smoothness. Ripples show up well with this method.

(far left)
Shoot on a light coat of primer and then lightly hand-sand. Again, high and low spots will show as dark and light areas.

(near left)
Apply spot putty (also called lacquer putty) to the low spots. Use many strokes, as this will both force the filler into low spots and allow it to dry faster.



Prime again, sand lightly. If everything looks good, you're ready for paint. This picture also shows how spot putty can be used to fill cracks in old paint so you don't have to strip the whole panel down to metal.

DRIVER wishes to thank S&M Auto Body of San Bernardino, Calif., for their assistance with the photographs in this article.

BACKfire

LETTERS to the EDITOR

FOUR WHEELIN'

I enjoyed immensely your article on 4-wheelin' (May '78) and, having seen the results of Murphy's Law being applied, I'd like to add a few points.

First, on picking the tools to take along: the key word is redundancy. Insofar as possible, select the tools to take with an eye to each one doing more than one thing. For example, rather than specify an axe and a large hammer, specify a single-bit axe which will also work as a large hammer. If you're taking along a lantern, make it a lantern that will burn unleaded gasoline (rather than propane) so that if you run out of gas for the lantern, you can tap the vehicle's gasoline supply. If you take vise-grip locking pliers instead of ordinary pliers, you might be able to eliminate some open-end wrenches. The list can go on and on.

Also, take along one or more long lengths of rope; they can be used for almost anything. My preference is ½-inch nylon.

Your advice about getting into LO range applies when on the road too, particularly when in the western mountains. Last summer, when traveling on U.S. Highway 666 from Springerville, Ariz., to Morenci, Ariz., I discovered that LO range gave more flexibility and safety (engine braking), particularly where the speed limit through curves was marked down to 10 mph. My FWD rig, by the way, has full-time FWD; people whose vehicle has locking hubs might try a different route.

Let's have more articles on 4-wheelin'.

SFC L. Breckler, USA
HQ USAREC (PAO)
Ft. Sheridan, IL 60037

I just finished reading the article "4-Wheelin' " in the May '78 DRIVER. I must say this was a good article but I strongly disagree with one statement that was made.

On page 6, first column, last paragraph, is the statement, " . . . check in your owner's manual before trying out your new toy." Since when does a 4,000-pound automobile become a *toy?*

I, being an off-roader, can say that in no way can a 4-wheel-drive baja bug or dune buggy be called a toy. The top pro off-road racers will say the same as I. I ask that you be more careful in what you print.

Now I would like to pass on something to other off-roaders that I learned the hard way.

When coming to a river or stream that is muddy, you can't very well tell how deep it is. The rule is: If you can see small waves on top of the river or stream, the water is shallow; but if the river or stream is smooth on top, it's too deep. This rule also can be used when the water is clear, and you don't even have to get out of your vehicle to check it.

Sp4 David W. Gray, USA
A Btry 2/78 FA
APO New York 09139

Thanks for the tip, David. You are so right. Our choice of words could have been better. Sometimes we're the only ones who think we're funny!

FREEDOM OF CHOICE

I have been riding motorcycles for 23 years, starting with a Cushman Eagle in 1955 and going on through the Indians, Nortons, and Harleys to my present Honda 750K.

In the '50s and early '60s I never rode with a helmet and never had a spill. In 1964, while stationed at Ft. Benning, Ga., I was required to wear a helmet while on base. Well as fate would have it I had my first big spill, and believe me my helmet took one heck of a beating – but not my head! I have been wearing a helmet ever since, and I thank God that my first big spill didn't come any sooner than it did!

I now have two sons, Keith (11 years old) and Kelly (8) who ride and race dirt. Keith has been riding for six years. Just the other day they both observed a rider without a helmet who was expressing his freedom of choice. They both had one unprompted comment: DUMMY!

1SG Felix L. Helms, USA
Troop I 3d Sqdn 3d ACR
Ft. Bliss, TX 79916

Good for Keith and Kelly! There's nothing like learning early in life.

MORE ON HELMETS

In direct reply to "GARBAGE," June '78 DRIVER, I've been a Security Policeman for 10 years. During that period, I've had the opportunity to investigate numerous accidents involving automobiles and motorcycles. In all these accidents, it has been determined through investigation that if the riders had not been wearing helmets in these motorcycle accidents, 85% would have resulted in severe head injuries or death.

Granted, mandatory helmets laws may be an infringement on individual rights, but anyone who swings his/her leg over a motorcycle and attempts to compete on the super highway jungle with the iron monsters without the benefit of head gear is obviously not wrapped too tight.

I've been riding bikes for 16 years and have been involved in numerous

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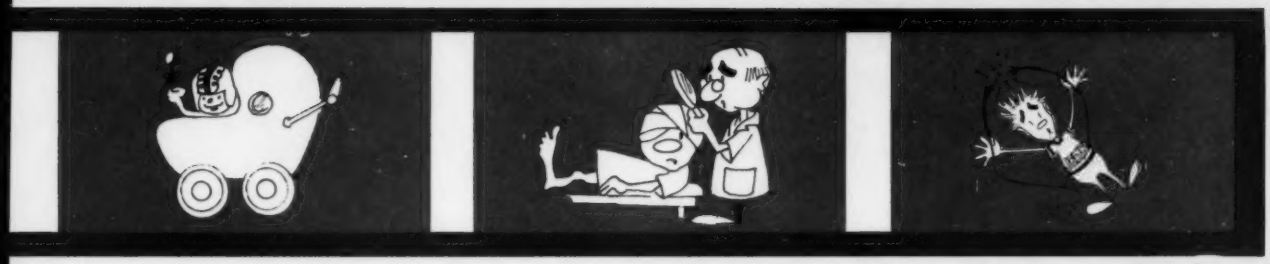
DRIVER Magazine
AFISC/SEDD Norton AFB CA 92409



spills during that time (competition as well as pleasure riding). Personally, I would not ride without a helmet.

As for the Sergeant's comments, I suggest he have his head examined before he gets it knocked off in an accident.

SSgt Joe C. Howze, Jr., USAF
3700 Security Police Sq (ATC)
Lackland AFB, TX 78236

AN OFFENSIVE DRIVER?

I appreciate the intent of your April Fool article on offensive driving. Too bad it didn't get here till June.

Anyhow, I would like to offer some serious tips on "offensive driving." When driving, I aggressively pursue specific goals, the main one being smoothness, trying to juggle my position in traffic to keep from applying brakes or gas. I use the high or low yo-yo and the energy management I learned as a fighter pilot to get spacing in traffic. I set up curves as I learned in auto racing. Combining the two, I can set up to pass on curves to get a jump on the other traffic, and come out of nowhere to leap into a hole in traffic. If I need to, I can double the speed limit with these techniques, though normally I try not to be so conspicuous.

The main payoff is that pressing for an advantage in traffic keeps me alert. Looking for a break keeps me aware of a way out of a possible accident or way to avoid road hazards. Knowing that I will push the car gives me the incentive to keep it in peak condition. And my driving makes definite moves that leave no doubt in the minds of other drivers of my intentions. Besides which, it's a lot more entertaining than following the taillights of the car ahead.

The bottom line is that, in contrast to your offensive driver, I haven't had an accident since I developed this driving style, although I had several before. I will admit to a few speeding tickets, but they're much cheaper.

Lt K. V. Koenig, USN
Box 37 Subic Naval Base
FPO San Francisco 96654

If you drive like this, you can't afford a moment's break in your intense concentration.

MOPED MISTAKES

Our "Soft Pedaling" article in the May '78 issue brought a few letters from people concerned about the photo of someone riding a moped over railroad ties. The caption to the photo was meant to be sarcastic, but some of you didn't get that. What we meant was: "If you ride your moped over rough surfaces, you're asking for suspension trouble." Can't you guys take a joke?

However, the joke's on us as well. The Honda vehicle pictured is an NC-50 Express, which is a small motorcycle. It's not a moped at all. We couldn't read the name of the man who pointed that out to us, but whoever you are you've got good eyes.

REVIEW OF ARTICLES

I have just read another issue (Jun '78) of your excellent magazine. I'd like to add a few words to some of the articles.

In your "More Miles Per Gallon" article, you should have underlined, starred and bold printed the part on driving ahead. Driving ahead has saved me many times over, particularly in heavy traffic. Driving ahead prepares you for stopping or slowing well in advance of the taillights (if they work) of the vehicle in front of you. This helps to keep me from being rear-ended, too. (I commute on a Honda Gold-Wing, 70 miles round-trip daily.)

Your article on the seatbelt simulator was interesting. I hope to see these simulators in wider use, both military and civilian, shortly.

Your article on "Basic Car Care" is good reading for us seasoned "Backyard Mechanics" too. I'd like to raise a couple of points here:

1. When hot wiring, take care to include the ballast resistor in the jumper circuit. Most "point and coil" ignition systems are designed to operate on 9 volts instead of 12 volts. Operating them on 12 volts for extended periods will ruin both the points and coil.

2. Although I have never had to hot wire a car or motorcycle with an electronic ignition, I recommend extreme caution be taken. There are more circuit designs for electronic ignitions than there are manufacturers. To borrow a phrase from electronic techs and electricians, "Electricity is quicker than the average jerk!" and it can ruin electronic circuits extremely rapidly if not properly applied.

3. When checking for leaks on your vehicle, the first step to take is a thorough degreasing of the engine and undercarriage. This allows a much more rapid location of the leak and you don't get as dirty when you fix the problem. A clean job is always a better job.

I won't belabor the motorcycle helmet dispute except to say that experienced, seasoned riders always wear protective gear when on the highway. I feel sorry for inexperienced riders, driving down the highway at 65+ mph with no shirts and their helmets securely fastened to the motorcycle. They will not have a second chance if they get into a "sky-ground, sky-ground" situation.

ETC Gregory A. Taylor, USCG
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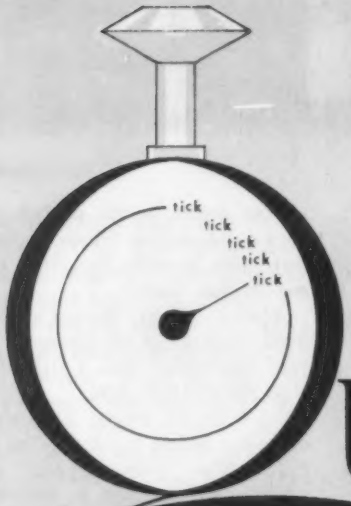

A QUICKIE REFLEX TEST

Reflexes are important to any vehicle operator. Along with good eyesight and a thorough knowledge of the rules of the road, reflexes are what enable us to drive safely. This simple test can tell you how well you're doing in the reflex end of the scheme. Simply point out the numbers, in order, beginning with the lowest and going to the highest. You don't have to call them out or mark them, just point to them. If you can do it in six seconds or less, you've got excellent reflexes . . . between seven and nine seconds, you're good . . . over 10 seconds, adjust your driving to include longer following distances and lower speeds. If you take more than 13 seconds, you don't pass the test . . . but it's a lot better to find out about poor reflexes with a test like this than to find out the hard way on a city street.

5	2	7	1
9	8	11	6
12	10	3	4

So much for instructions. Grab a watch with a sweep second hand, turn the page upside down, and go, man, go!